

What is claimed is:

1. A balancing device of a raising-lowering window arranged in a movable shoji opened and closed in the vertical direction, and holding a dynamic balancing relation with the weight of the movable shoji and resting the movable shoji in an arbitrary position and facilitating the opening and closing operations,

wherein said balancing device is constructed by a balancing force adjusting device, a balancing force generator, a slide body and a spiral rod;

the balancing force adjusting device is fixedly arranged in the upper portion position of a longitudinal frame and is constructed by a case, a horizontal gear member, a click member and a vertical gear member,

the horizontal gear member is rotatably arranged around the horizontal axis in a predetermined position within this case and a gear is formed on the side of a head portion of the horizontal gear member, and a ratchet gear is formed around a shaft portion of the horizontal gear member, and a screwdriver engaging portion is formed on a shaft end face of the horizontal gear member facing the case exterior,

the click member is rotatably arranged in a predetermined angular range around the horizontal axis in a position adjacent to said horizontal gear member, and a screwdriver engaging portion is formed on a shaft end face of the click member facing

the case exterior, and two clicks extending in said horizontal gear member direction are respectively arranged on both the sides of an intermediate shaft portion within the case, and one of said clicks is biasedly engaged with the ratchet gear formed in the shaft portion of said horizontal gear member, and the other click is engaged with the ratchet gear when the engagement of the one click is released by a swinging operation, and

the vertical gear member is rotatably arranged around the vertical axis in a predetermined position within said case, and a gear engaged with the gear of the head portion of said horizontal gear member is arranged in the upper portion of the vertical gear member, and a connecting shaft is arranged in the lower end portion of the vertical gear member, and the vertical gear member is dependently rotated by rotating said horizontal gear member;

the balancing force generator is constructed by a torsion spring storing sleeve, a torsion spring stored within the torsion spring storing sleeve, and a rotating operating body arranged in the lower end portion of the torsion spring, and the balancing force generator is connected to the vertical gear member of said balancing force adjusting device and is arranged in a vertical arrangement, and at least the torsion spring is rotated and operated around the axis by an adjusting operation in the balancing force adjusting device so that balancing force can

be introduced and adjusted with respect to the torsion spring and an upper direction force balancing with the movable shoji is given by said torsion spring at the opening and closing times of the movable shoji;

the slide body is fixedly arranged in a lower end side portion of said movable shoji, and is raised and lowered as the movable shoji is vertically moved; and

the lower end of the spiral rod is fixed to this slide body, and the tip portion of the spiral rod extends through the rotating operating body of said balancing force generator and is inserted into the torsion spring storing sleeve, and the spiral rod performs winding and unwinding operations of the torsion spring by giving rotating force around the vertical axis to said rotating operating body as said movable shoji is vertically moved.

2. A balancing device of a raising-lowering window arranged in a movable shoji opened and closed in the vertical direction, and holding a dynamic balancing relation with the weight of the movable shoji and resting the movable shoji in an arbitrary position and facilitating the opening and closing operations,

wherein said balancing device comprises balancing means for giving an upper direction force balancing with said movable shoji by a torsion spring, slide means attached to a side portion lower end of the movable shoji and guiding the movable shoji

along a longitudinal frame while guiding the movable shoji, a spiral rod for operating this slide means and said balancing means in cooperation with each other and performing winding and unwinding operations of the torsion spring of said balancing means as the slide means is moved, and adjusting means of said torsion spring assembled into said slide means;

said torsion spring adjusting means is constructed by a ratchet shaft member and a click member;

the ratchet shaft member is rotatably arranged around the vertical axis in a predetermined position, and a connecting portion connected to said spiral rod is arranged in the upper end portion of the ratchet shaft member, and a ratchet gear is formed around a shaft portion of the ratchet shaft member, and a screwdriver engaging portion is formed on a shaft lower end face of the ratchet shaft member facing the exterior, and

the click member is rotatably arranged in a predetermined angular range around the vertical axis in a position adjacent to said ratchet shaft member, and a screwdriver engaging portion is formed on a shaft lower end face of the click member facing the exterior, and two clicks extending in said ratchet shaft member direction are respectively arranged on both the sides of an intermediate shaft portion, and one of said clicks is biasedly engaged with the ratchet gear formed in said ratchet shaft member, and the other click is engaged with the ratchet gear when the engagement of the one click is released by a swinging

operation.

3. The balancing device of the raising-lowering window according to any one of claims 1 and 2, wherein the other side click among the pair of left and right clicks formed in said click member is omitted, and one side click engaged with the horizontal gear member or the ratchet gear of the ratchet shaft member at all times is used.